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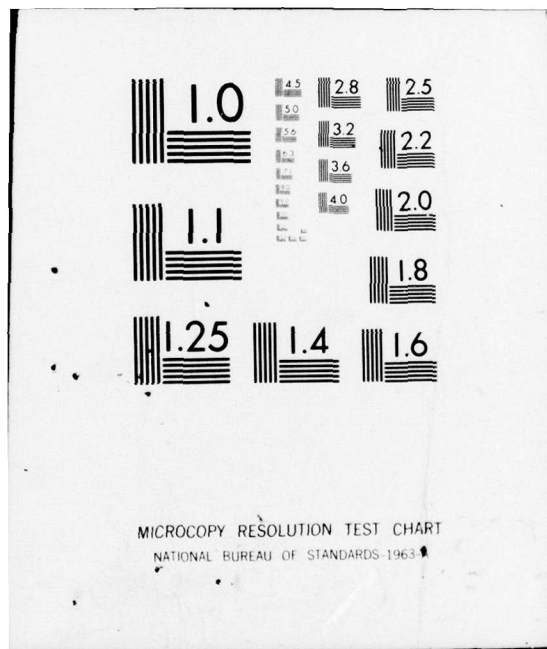
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A NEW KNIT WATCH CAP: A DESIGN AND FIELD EVALUATION STUDY



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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Navy Clothing and Textile Research Facility (NCTRF) conducted a field evaluation study of a knit watch cap made of 100% wool and with a process representative of many hat manufacturers throughout the related specialty knitting trade to determine its feasibility for possible adoption by the Navy. This study was necessitated because one manufacturer has made the standard knit watch cap the past 5 years, resulting in a continually escalating cost per unit. The proposed knit watch cap was found to be comparable in all respects with the standard knit watch cap also made of 100% wool.		

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particularly in regard to its most desired characteristics of warmth and comfort. Based on the conclusion from the study, NCTRF recommends that the proposed knit watch cap construction be included as an alternative to the standard knit watch cap construction. We also feel that a more receptive response to Invitation for Bids promulgated by the government will be realized. (U)

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A NEW KNIT WATCH CAP: A DESIGN AND FIELD EVALUATION STUDY

INTRODUCTION

The Navy Clothing and Textile Research Facility (NCTRF) conducted a 90-day wear test program on a prototype knit watch cap made of 100% wool and constructed by a process representative of many commercial hat manufacturers throughout the related specialty knitting trade. To encourage a better response to Invitation for Bids for the standard knit watch cap as specified in Military Specification MIL-C-16472, this program was initiated to determine the feasibility of using the prototype knit watch cap as an alternate construction. The standard knit watch cap is issued to all Naval male personnel as a bag item, with an annual drawdown of about 190,000 caps. In addition, the Department of the Air Force procures almost 35,000 annually for issue as an optional item. The Defense Personnel Support Center, Philadelphia, PA, has procured over 1.5 million knit watch caps since 1969.

This report will discuss the comparable design characteristics of the prototype and the standard knit watch caps and summarize the field test data.

DESIGN AND CONSTRUCTION

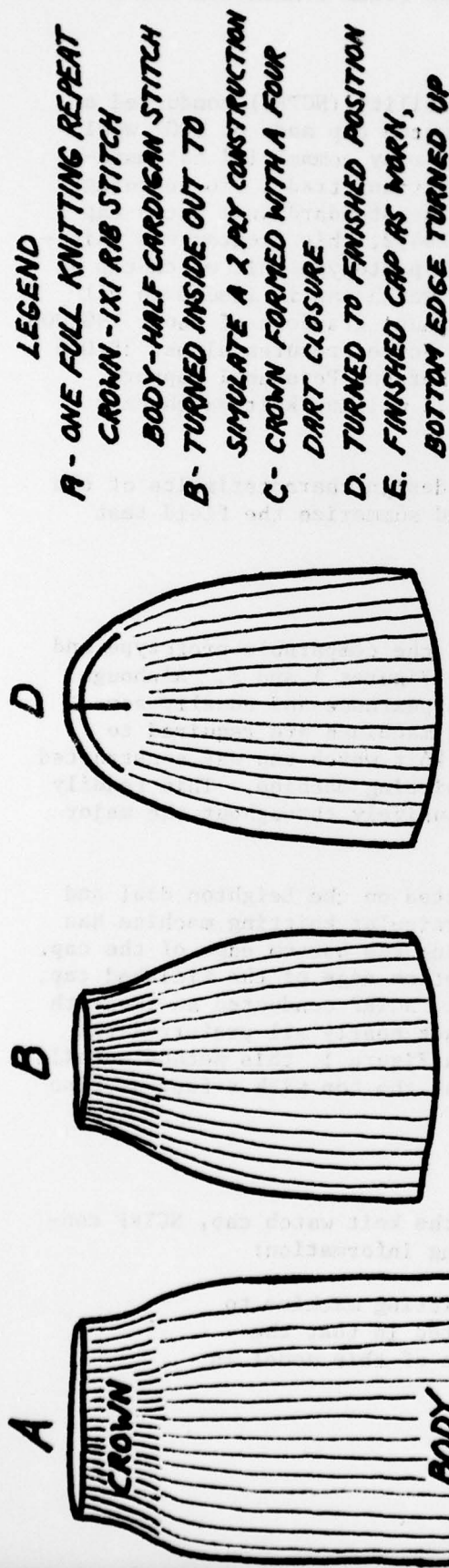
The design and construction processes of the comparable prototype and standard issued watch caps are illustrated in Figures 1 and 2. Although the finished knit watch caps are similar in appearance and equally serviceable, two different and distinct knitting machines are required to achieve the finished results. The prototype knit watch cap was constructed on the Tompkins dial and cylinder circular knitting machine. This readily available knitting machine is being used exclusively throughout the major portion of the specialty hat knitting trade.

The standard knit watch cap was constructed on the Leighton dial and cylinder circular knitting machine. This particular knitting machine has an added three-needle rack device for finishing the bottom edge of the cap. While this method prevents raveling of the bottom edge of the finished cap, it is not the only finishing method. In fact, NCTRF conducted an in-depth survey of cap manufacturers which revealed that nearly all preferred the Tompkins finishing method. As illustrated in Figure 1, this method entails turning the cap inside out and finishing it at the top with a four-section dart closure.

SURVEY OF CAP MANUFACTURERS

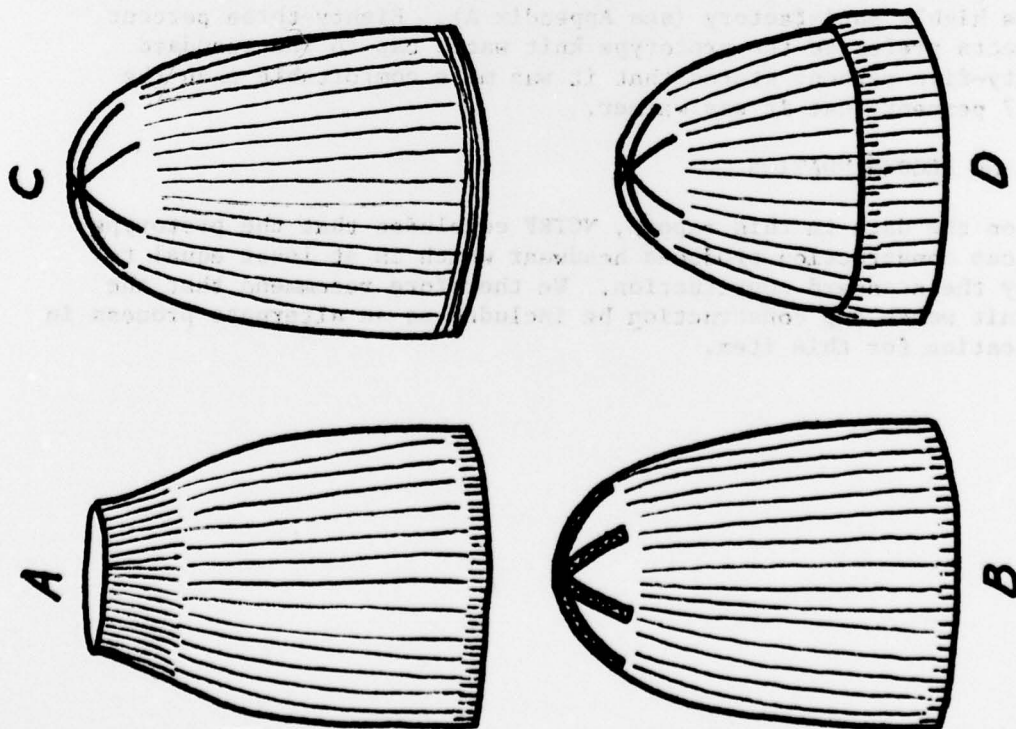
To learn why there were few bidders on the knit watch cap, NCTRF conducted its survey which revealed the following information:

1. The availability of the Leighton knitting machine to potential contractors is quite limited in that the manufacturer discontinued production of this model in 1968.



**FIGURE 1 - DESIGN AND CONSTRUCTION OF PROTOTYPE
KNIT WATCH CAP**

- LEGEND**
- A-SINGLE PLY CONSTRUCTION**
 - CROWN- 1X1 RIB STITCH**
 - BODY-HALF OR FULL CARDIGAN STITCH**
 - BOTTOM- 1X1 RACK STITCH**
 - B- CROWN FORMED WITH A SIX DART CLOSURE**
 - C- TURNED TO FINISHED POSITION**
 - D- FINISHED CAP AS WORN, BOTTOM EDGE TURNED UP**



**FIGURE 2- DESIGN AND CONSTRUCTION OF STANDARD
ISSUE KNIT WATCH CAP**

2. Even if a cap manufacturer purchased a Leighton machine today, he would pay about three times more for it than for the Tompkins model.
3. Based on the annual procurement of knit watch caps, a significant cost reduction per unit would be realized by the government if the prototype knit watch cap were included in the subject specification.
4. There is also evidence that at least 25 other manufacturers would be interested in bidding on the item if it could be produced on a Tompkins machine.

TEST SITE AND DATA

The wear test evaluation of the prototype knit watch caps was conducted over a 90-day period at the U.S. Naval Facility, Keflavik, Iceland. The evaluation period commenced in October 1976, with the average temperature around 30° F. Each of 40 test subjects was issued one prototype knit watch cap and was requested to wear the item as much as possible throughout the allotted time frame. After the 90-day period, the test subjects were asked to express their personal opinions regarding style, warmth, and comfort as compared with their standard knit watch cap.

Analysis of the limited responses (12) indicated that the participants in general regarded the style, comfort, and warmth characteristics of the test item as highly satisfactory (see Appendix A). Eighty-three percent of the subjects preferred the prototype knit watch cap to the standard cap. Seventy-five percent stated that it was more comfortable than the standard, 67 percent that it was warmer.

CONCLUSION AND RECOMMENDATION

Based on the data in this report, NCTRF concludes that the prototype knit watch cap construction produces headwear which is at least equal to that made by the standard construction. We therefore recommend that the prototype knit watch cap construction be included as an alternate process in the specification for this item.

APPENDIX A. SUMMARY OF FIELD TEST RESULTS.
(responses are shown numerically)

1. Indicate how you liked the experimental knit watch cap as compared to your standard-issued knit watch cap.

Superior	Better	Same	Not as Good	Worse
<u>3</u>	<u>7</u>	<u>0</u>	<u>0</u>	<u>2</u>

2. In comparing the comfort of the experimental knit watch cap to your standard-issued knit watch cap, the experimental knit watch cap is:

Superior	Better	Same	Not as Good	Worse
<u>2</u>	<u>7</u>	<u>1</u>	<u>0</u>	<u>2</u>

3. In comparing the experimental knit watch cap to the standard-issued knit watch cap relative to warmth, the experimental knit watch cap is:

Superior	Better	Same	Not as Good	Worse
<u>4</u>	<u>4</u>	<u>2</u>	<u>0</u>	<u>2</u>

4. List any comments that you have about the experimental knit watch cap you have just tested and the standard-issued knit watch cap you wear. These comments may include suggestions or complaints about the style, comfort, appearance, etc.

The experimental knit watch cap in general was considered better in appearance than the standard-issued knit watch cap.